California's Experience with High Speed Rail

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Much has been written about California's experience with high-speed rail. Critics point to cost overruns, schedule delays, litigation and challenges to routing, etc. to claim that California's program has failed. In fact, construction is underway in California on what would be America's first true high speed rail system and the vision of what this project would mean for the State remains clear. California's experience provides important lessons that can help shape federal funding and guidance for future high-speed rail programs.

It is important to note that California's program was ambitious from its inception. The state envisions an 800-mile high-speed rail network connecting major urban centers. The first phase of 520 miles will run from Los Angeles/Anaheim to San Jose/San Francisco, passing through the Central Valley cities of Bakersfield, Fresno, etc. The second phase would add links to Sacramento from the Bay Area and from Los Angeles to San Diego. The line must penetrate two major mountain ranges, deal with seismically active zones, wetlands and land subsidence in agricultural regions subject to groundwater overdraw. The construction of this mega-project must deal with serious issues of species protection, community preservation, environmental justice issues and so forth.

Here are some key lessons from California:

1. *Well-intentioned federal and state requirements to assure the program met certain objectives created pathways for litigation, leading to delay and cost growth.*

California's High Speed Rail Authority was established in the 1990s and spent many years in planning and environmental review. The program had a quantum leap forward in 2008-2009. First, California voters enacted Proposition 1A, a $9.95 billion bond measure for High Speed Rail, in November, 2008. By its

terms, it was intended to provide only a portion of the funding for the program.

The expectation was that the program would receive 1/3 of its funding from the State, 1/3 from the federal government and 1/3 from the private sector. However, the bond measure also included very precise limitations on how the funds could be used; the authors wanted to ensure that the funds would only be available for true high-speed rail and not subject to being bled off on local transit projects. So, Proposition 1A mandated restrictions on use of the bond proceeds to construct a system that would be:

- Fully electrified
- Capable of sustained speeds of 200 mph or more
- Designed to achieve a non-stop transit time from downtown Los Angeles to a specific site in San Francisco in 2 hours, 40 minutes
- Capable of operating without an operating subsidy

While the limitations on fund use were based on a sound policy to assure that only a true high-speed rail line was to be built, in fact these criteria became tools for project opponents in aggressive and multiple litigation challenges. Some of those challenges were successful in delaying the program as the High Speed Rail Authority struggled to prove, at an early stage of design, that in fact the system would meet those criteria. One unfavorable ruling, later reversed on appeal, barred the Authority from access to the bond funds for more than a year, just as the first construction contracts were being signed. This decision resulted in cascading delays and significantly increased costs.

In parallel, while the California program benefited from significant funding from the American Recovery and Reinvestment Act, receiving $2.6 billion in ARRA funds and an additional $928 million in FY 10 dollars after three states returned their ARRA grants, those monies came with a key condition. ARRA, intended as a stimulant for a collapsed economy, required the funds appropriated thereunder be used by September 30, 2017 or else returned to the Treasury. However, the hard deadline also provided fodder for project opponents who were open about the

strategy of delaying the project so that the federal funds would disappear. They successfully sought to have the Surface Transportation Board assert jurisdiction over the project at an early stage (but were unsuccessful in getting STB to reject the project application) and they encouraged local landowners not to enter into right-of-way agreements but instead force eminent domain actions.

Perhaps the biggest impact of the ARRA deadline was that it forced the project to begin construction without having completed land assembly for the corridor. The Authority faced a Hobson's choice; it had favorably-priced bids in hand for first construction, but those would expire. If it waited until the outcome of the litigation, mentioned above, and the acquisition of all the land, the clock would run out on federal funding and untapped funds lost forever. On the other hand, if it commenced construction, it would likely have access the federal money (vital since the judge's ruling had blocked access to state bonds) but would almost certainly suffer delay damages when contractors' work was interrupted because parcels had not been acquired. The Authority chose the second path based on an analytical data, but after-the-fact land acquisition has proven to be a slow, difficult and expensive process.

Accordingly, funding at both the federal and state levels that was intended to advance high-speed rail came with provisions that were used against the project in legal and political challenges. These were successful in slowing the project, which led to higher cost estimates and some exhaustion of political support.

2. *The program made promises that were unrealistic, especially about the timing of private sector involvement.*

A key element of the California plan was the participation of the private sector. In looking at high-speed rail systems across the globe, it was evident that such systems – *once constructed* – have been able to sustain their operations from the fare box. Accordingly, California law provided that the system would have to function without any "operating subsidy." While some critics claim the system will be subsidized, they generally make that false assertion by conflating capital

expenditures with operations. California's program contemplates that the system would be turned over to a private operator at some point. This follows the model of the Japanese development of their Shinkansen system. That government built the first part of the system in the 1960s and turned over operations to private companies in the 1980s. California's plan was to construct the first segments of its system and then auction concessions to operate to private operators, using the proceeds to help construct subsequent sections.

While international operators of high-speed rail systems have expressed strong interest in participating in the California program, the structure of the program has not enabled their participation at this juncture. They cannot assume market risk now, given that (1) there is no operating experience in the United States on which these companies can base estimates of ridership and revenues and (2) since the California Proposition 1A bond act prohibits any operating subsidies even in early years, a private operator would bear full risk of loss, especially in the start-up phase. Recognizing this reality, California's plan is to have a publicly-funded initial segment in operation that can then provide insight into ridership and revenue and, once established, begin the auction process.

Conservative critics have hammered the program for lack of private sector involvement, claiming it shows that the underlying idea is flawed and uneconomic. These critiques are without merit, but it would have been better for California to have provided a limited period of safety-net operating subsidies early on, with assurance of pay-back, as a means to involve the private sector earlier in the process.

3. *California's decisions on route selection and sequencing have been controversial politically.*

Many critics of the California program suggest that the line should have been built directly between Los Angeles and San Francisco, paralleling Interstate 5. However, the Bond Act was specific in calling for High Speed Rail to connect the various regions of the state. This meant the alignment would divert through the

Central Valley, a region that suffers from poverty, lack of economic diversity, poor access to major metropolitan centers and so forth. This decision will be highly beneficial to the state in the long run, but the objective of using high-speed rail not just for point-to-point transportation, but as a tool for economic and social integration meant that it was always destined to cost more and be more difficult to construct.

Similarly, the decision to commence construction in the Central Valley – in the middle rather than at one end – has been the most controversial element of the California program. There were legitimate policy and programmatic reasons for this decision, but it meant that many urban elites (and their political representatives) were either disinterested in the program or hostile to its devoting resources outside their regions. Later decisions to emphasize potential initial operations solely in the Central Valley further isolated the program from important policy-making constituencies. Unfortunately, this is a self-reinforcing pattern; the longer the estimates for the high speed rail service to connect to major metropolitan centers, the less patience those areas have, which leads to erosion of political support and funding which further delays the program.

4. *The Growth in Cost Estimates is due to many factors, some of which were difficult to predict or to control.*

All mega-infrastructure projects have difficulty accurately forecasting costs at the early planning stage. In California's case, much (but not all) of the cost growth between early estimates and current numbers was attributable to facts on the ground being markedly different than planners could foresee. For example, the original alignment into the Los Angeles area called for the project to closely follow interstate highways and state roads. However, such routing turned out to raise serious environmental and environmental justice concerns. To avoid impacts on thousands of homes and businesses, the project was realigned to bypass communities, relying instead on a 22-mile tunnel through the San Gabriel mountains. The tunneling costs will be significant, adding perhaps $10 billion

dollars to the budget. This same pattern emerged in other regions where communities clamored for undergrounding of the line to avoid local impacts or areas where the alignment had to be changed to protect threatened species. Basically, as "social costs" were internalized to become "project costs," the estimates rose markedly.

As mentioned above, the land acquisition process was more difficult than forecast due to the combined pressures of litigation and the ticking clock on use of federal funds. This was one of the largest drivers of cost increases.

Other unforeseen regulatory requirements, including preservation of historic structures, also contributed to higher actual costs. A good case in point involves railroad safety rules. The state Bond Act mandated that the alignment had to hew, as closely as practical, to existing transportation and utility corridors. This seemed like a reasonable requirement to limit environmental damage and as a consequence, the route in the Central Valley was laid out alongside existing freight rail tracks. However, the Federal Railroad Administration then determined that to prevent collision risk from derailment, the lines had to be at least 102 feet apart or in the alternative a large intrusion barrier would be required. Since the alignment was set already, the California program faces almost a half billion dollars in unplanned costs for intrusion barriers over the first 120 mile segment

5. *California has wisely viewed its High Speed Rail Program not as a stand-alone entity, but rather as part of a broader rail modernization, integrating inter-city fast rail with regional and local systems.*

One of the most successful elements of California's program came through a policy change in 2012. At that point, the High Speed Rail Authority declared that it considered its project to be more than a single-purpose rail line, but rather as part of an integrated statewide rail modernization program. The Authority entered into agreements with regional operators to blend operations in urban corridors, eschewing the need for stand-alone high-speed only tracks that would have cost tens of billions to build in those densely populated areas. Since the trains proceed

at lower speeds in such corridors, the impact on overall travel time and associated revenues was de minimus. This also built significant political support, since the high-speed rail program co-funded local improvements such as the electrification of the Caltrain service between San Francisco and San Jose, a popular commuter system. The High Speed Rail Authority similarly worked closely with local officials to share costs and design for major station hubs in San Jose and Los Angeles.

These relationships were important, especially since California is moving to create a greater reliance on rail transportation over the coming decades as a centerpiece of state efforts to control greenhouse gas emissions from the transportation sector.

Unfortunately, the negative by-product of the blending of operations in urban areas was that it allowed critics to claim the project was "no longer high speed rail." This is a canard, since the overall travel time still meets the Bond Act requirements for non-stop service, but as a political attack it has proven effective.

6. *Conclusions and lessons for the future*

California has made both stumbles and strides in developing high-speed rail. The program is clearly more challenging and difficult than originally envisioned. It will take longer and cost more. There are legitimate critiques of both internal management at the High Speed Rail Authority and of its management of key contractors. At the same time, today several thousand people are building the backbone of the system in Central California. That region is not only the poorest area of California - the poverty rate in Fresno exceeds 25% - but one of the most economically challenged in the United States. These expenditures in an area of traditional underinvestment accomplished the goals of ARRA through dramatic reductions in unemployment and studies have shown that one of every three jobs in the region is tied to high-speed rail investments there.

The state has committed enormous resources to the project, in terms of both a bond measure and in allocating 25% of its Greenhouse Gas Reduction (Cap and

Trade) funds to high-speed rail. State funding became vital given the lack of federal support which was withdrawn after the initial ARRA/FY 10 appropriations; the absence of further federal support has hobbled the program badly .

In retrospect, the program would have been more successful had it started first in the highest density ridership corridor between Los Angeles and San Diego. That link also would have been easier to build physically and had a much higher profile. However, it would not have afforded the opportunity to invest in a traditionally underinvested region or connected it with the major population centers.

Some other lessons from the California experience include:

a. Securing right-of-way and corridor early in the process is key. Environmental laws have precluded the acquisition of corridors until the analysis is completed, but this leads to significant delays and such policies should be reassessed.
b. Project leadership is critical. There is a tendency to replicate state bureaucratic structures and use traditional public agency models. In fact, it is essential to have internal and contract management personnel with deep experience in integrated management of complex infrastructure systems. This probably necessitates a payment scale beyond what is customary for public agencies to attract top personnel.
c. Projects should be designed to maximize land value around stations. Dense transit-oriented development is important not only for enhancing ridership and promoting sustainability, but also to attract private capital. Japan Rail East, which operates a large portion of the nation's Shinkansen system, receives one-third of its operating revenues from real estate development around the stations. In California, no provisions were made to give the High Speed Rail Authority land use control of the station areas and there is no provision for it to capture value from station area development.

d. Financing mechanisms are important. A steady funding stream provides opportunity for efficient planning and management, but perhaps more importantly, it allows for the financing of projects to accelerate construction. The benefits of reduced construction times and avoidance of inflationary effects will likely outweigh the financing costs.

e. Large scale projects such as intercity high-speed rail require sustained leadership and a long-term vision. It took four decades to complete most of the interstate highway system and much of that occurred before modern environmental policy review was required. These projects must be the subject of a national policy commitment (ideally without partisanship) and leaders who are willing to encourage them for the long term benefit of the nation.